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AUTHOR Moallem, Mahnaz
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ABSTRACT

Instructional designers believe that it is important to expose pre-service and in-service teachers to Instructional Systems Design (ISD) procedures and products so teachers can utilize them. Educational literature, however, reveals few attempts to relate instructional design theory and methods to teaching practice. This paper proposes a new conceptual model for thinking about teaching that incorporates current findings of research on teachers' thinking and components of instructional design models and principles. The paper reviews the major findings of research on teacher thinking and instructional systems design, and then presents a conceptual model to bring the two closely related fields together. Potential implications of the model for instructional development and research in instructional design and teacher thinking include: (1) teachers and their teaching and learning processes can only be studied within their social and cultural context; (2) teachers' knowledge is a complex blend of personal, practical, and theoretical knowledge--research in teaching, learning, and instruction has to shift its emphasis from cognition to social construction of knowing; (3) the image of teachers as designers of their own instruction needs to be emphasized in the instructional technology field, and the instructional design models and principles should be reconceptualized if they are to be used by teachers; (4) the concept of design as an artistic, social, and cooperative act should replace the procedural and technical concept of design--instructional design activities should focus on the product of the design instead of the procedure; and (5) instructional design models and principles should focus on an approach in which the design objectives and strategies or solutions evolve as the teacher-designer becomes more acquainted with the social and cultural system and subsystems, and people who are affected by the design, including learners, should participate in the decision-making process. (Contains 84 references.) (SWC)

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Title:

Instructional Design Models and Research on Teacher Thinking: Toward a New Conceptual Model for Research and Development

Author:

Mahnaz Moallem, Ph.D.
The University of North Carolina at Wilmington
Department of Specialty Studies
Watson School of Education

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Introduction

Many instructional designers are concerned about the difficulties with disseminating Instructional Systems Design (ISD) models to teachers who are believed to be potential users of ISD (Burkman, 1987). Often lamenting that they do not seem to impact the public schools, instructional designers believe that exposing pre-service and in-service teachers to ISD procedures and products is a very important and first step in turning the situation around (Driscoll, 1989).

However, educational literature reveals few attempts to relate instructional design theory and methods to teaching practice. While research in teacher thinking presents a new image of teachers and teaching practice, very few of these findings are reflected in instructional design theories and models.

The purpose of this paper is to propose a new conceptual model for thinking about teaching that incorporates current findings of research on teachers' thinking and components of instructional design models and principles. The paper, therefore, will focus on reviewing the major findings of research on teacher thinking and instructional systems design. A conceptual model will then be presented to bring the two closely related fields together. The potential implications of the model for instructional development and research in instructional design and teacher thinking will also be discussed.

Instructional Systems Design Models and Principles

Instructional systems design draws its models and principles from a variety of disciplines mainly: general systems theory, communications theory, learning theory, and instructional theory (Richy, 1986). Instructional systems is defined as an arrangement of resources and procedures used to promote learning (Gagne, Briggs, & Wager, 1988). This definition uses the term instructional planning as a complete process of analysis, design, development, implementation and evaluation. A number of models have been developed by designers during years of instructional design practices (see Andrew & Goodson, 1980). Design models come from industry, education, the military branches, and a variety of other sources. These models define what should be and prescribe the necessary activities and sometimes prescriptions for effective instruction. Some of these models are called "conventional models" and focus on the instructional systems level with a closed system approach to design (Banathy, 1987). Complementary to the conventional (micro) instructional design models are macro-design or systems models that have a different purpose, different systemic characteristics, and use a different design approach. The purpose of these models is to provide societal-based systems and arrangements of learning resources and connect these systems and arrangements with the learning experience level of education.

Despite variability among different conventional instructional design models, they are all characterized by three key features: (1) a linear planning process, (2) an objective-first approach to planning, and (3) a generic model for planning instruction. These models usually begin with specifying instructional goals, developing a list of specific objectives, developing test items for each objective, and developing instructional strategies. After the implementation of instruction, the next step is to evaluate the plan to examine its effectiveness. The last and most important step is to review the instruction based on the performance information and to revise it as required.

The effectiveness of the different aspects of conventional instructional design models are supported by teacher effectiveness research and research on cognitive processes of learning. The effectiveness of an educational program that is designed by the complete instructional design models (macro and micro) has also been investigated and supported.

Instructional Design Models and Images of Teachers and Teaching

Since the establishment of the instructional systems design field, a major effort of experts in the field has been to use ISD models and principles to improve education at public school. Generally speaking, two approaches have been primarily used to disseminate ISD models in public schools. The first approach has been to provide school systems with systematically designed curriculum and materials to be implemented by teachers. The teacher-training programs and/or teachers' guides would be centered on the development of necessary skills needed by teachers to implement the systematically designed curriculum. This approach was primarily based on the designers' image of teachers as "delivery systems" (Tosti & Ball, 1969), which later changed to the image of "teachers as managers" (Taguchi, 1993).

The second approach centered on the idea of teachers as designers and developers of their own instruction (Taguchi, 1993). This approach aimed to empower teachers to be actively involved in their curriculum design. On the basis of this approach, teachers would design their instruction using fundamentals of instructional design models to plan, evaluate and modify instruction as a regular and on-going process and part of their classroom instruction (Dick & Resier, 1989).

However, none of the above approaches are found to be successful in disseminating ISD models and theories at public schools. Research on curriculum implementation showed that in spite of the designers' efforts at in-service and pre-service training, teachers failed to implement instructionally designed products (Back & McCombs, 1984, cited in Burkman, 1987). Although the researchers linked the lack of success to the poor dissemination efforts and lack of support for teachers who used the materials, critics questioned the assumptions that the teacher is a passive recipient of educational products, and that a technology of teaching is transferable from one situation to another. Research in staff development and teacher decision making also supported these suspicions (Posner, 1995).

While instructional designers had some success in providing training and practice in instructional design and theories in teacher education programs (Snelbecker, 1987), the available information on teachers and their use of instructional design practice is not encouraging either. Some of the research on teacher planning and decision making processes (e.g., Shavelson, 1983; Brown, 1988) reveal that teachers typically do not plan and provide instruction in accordance with procedures taught in teacher preparation programs. Yet, other studies have shown that experienced teachers do believe that rationale models are to be taught to novices (e.g., Neale, Pace & Case, 1983) and they do attend to learning outcomes, sometimes during teaching and sometimes after interactive teaching is over (McLead, 1981).

This discrepancy between teachers' non-use of systematic models and their favorable attitude toward them raises many issues regarding ISD models. A number of reasonable explanations have been identified. Educational technologists (e.g., Tessmer & Wedman, 1990) have begun to acknowledge the complexity of design and development processes, and they have described ways of adjusting this complexity to the contexts in which such processes are employed. However, despite the tremendous explosion of knowledge derived from research on teachers' thinking and teaching over the last two decades, very little of this emerging knowledge concerns ISD. As the gap between teacher-thinking research and instructional design models and principles becomes wider, the possibility that ISD models will be used in school systems becomes lessened.

In an attempt to relate findings of research on teacher thinking to instructional design models and practice, in the following section I present a synthesis of research on teacher thinking. I then use the findings of this research to propose a conceptual framework for thinking about teaching considering instructional design models and principles.

From Teachers as Decision Makers to Teachers as Sense Makers: A Synthesis of Research on Teacher Thinking

Much of the early research on teachers' thinking and decision making was based on an analogy between teachers' diagnoses and medical diagnoses (e.g., Barrows & Bennett, 1972; Elstein, Shulman, & Sprafka, 1978). It was believed that the major role of teachers was to diagnose children's difficulties and progress and, on the basis of the diagnoses, prescribe effective and appropriate learning tasks for them. This image of the teacher was influenced by theories in cognitive psychology, which in turn was influenced by a communication information-processing model. This influence led to research on teachers' thinking in 1975 that assumed parallel cognitive processes between teachers and physicians (e.g., Fogarty, Wang & Creek, 1982; Marland, 1977; Morine & Vallance, 1975). The main focus of many of these studies was on the structure and content of teachers' thoughts and sometimes their cognitive processes.

However, many researchers have sought to demonstrate a close parallel between teachers' thought processes and specific models of thinking, especially the decision-making model (Clark & Peterson, 1986; Shavelson & Stern, 1981). Early models of the decision-making process among teachers implied a linear course of action with alternative branches, which was very similar to the models of diagnostic problem solving in medicine (see Kagan, 1988). In general, this body of research has focused on cognitive processes, rather than on the more general knowledge which guides the practice

of teaching in complex classroom situations (Borko, Livingston, McCaleb, & Mauro, 1988; Clark & Peterson, 1986; Marland & Osborne, 1990; Wood, 1988).

In the past fifteen years, researchers in the field of teachers' cognition have grown increasingly sensitive to the importance of classroom ecology in attempting to identify teachers' problem-solving strategies (Kagan, 1988). Once researchers began to look closely at the ecology of the classroom, it became clear that teachers work in a context that is complex in terms of multiple activities and continual, unpredictable change. Mechanistic decision-maker frameworks seemed inappropriate to explain how solutions were found for the myriad of complex practical problems continually confronting teachers within their classrooms and school communities (Carter, 1990; Johnston, 1993). The volume of differential knowledge and the rapid pace with which teachers must access this knowledge suggested a highly specialized form of clinical problem solving. Along with this shift, teacher cognition has developed into a wider concept of "teacher thinking".

Hence, in recent years the image of the teacher as decision maker has been replaced with an image in which "sense-making" is the central cognitive activity of teachers (Kagan, 1988; Clark & Peterson, 1986; NCRTE, 1988; Freeman, 1990, 1991). In this view teachers not only make decisions, but they engage in several activities, including decision making, in order to make meaning for themselves and their students (Clark, 1986). Thus, the metaphor of teacher as physician is giving way to the image of teacher as sense maker or reflective professional (Schon, 1983).

According to the metaphor of teacher as reflective practitioner, the problems of practice are messy, uncertain, complex and context-bound; and, therefore, teachers must resolve such problems by mentally experimenting and manipulating contextual factors, generating alternative hypotheses about the problem and mentally testing them in order to come up with a discovery that leads to action (Schon, 1987). This process of reframing (seeing the situation in a new way as a result of unexpected messages from practice) (Mumby, 1986), experimenting (generating hypotheses about the problem), acting (testing a new approach to practice) and reappraising is called reflection-in-action (Mumby & Russell, 1989). This image looks vastly different from the image of teaching as consisting of well-formed instrumental problems that can be solved by applying theory and techniques derived from previous research. Thus, professional practice is not "theory", but the process of developing and using practical theories of action.

The Idea of Professional Knowledge

It has been since 1975 that research on teacher thinking has emerged within the field of cognitive psychology. Two perspectives have existed on the concept of teacher knowledge: cognitive and epistemological. The advocates of the cognitive perspective believe that teachers are professionals who make reasonable judgments and decisions in a complex, uncertain environment (Borko & Shavelson, 1990). On this view, there is a relationship between thought and action. There is first thought, and then action. Two lines of research in the past decades have done much to enrich our understanding of teacher knowledge: expert-novice research and research on the content and domains of teacher knowledge.

Research comparing expert and novice teachers (e.g., Berliner, 1987; Greeno, Glaser & Newell, 1983; Larkin, McDemott, Simon, & Simon 1980; Leinhardt, 1983; Leinhardt, Weedman & Hammond, 1984) demonstrates that the amount of knowledge and the ways in which experts organize their knowledge is different from that of novices. Research on the content and domains of teachers' knowledge suggest different categories of knowledge. Shulman (1986a) emphasizes three (3) types of content knowledge: subject matter knowledge, pedagogical knowledge and curricular knowledge. Clark and Lampert (1986) mention three (3) categories of knowledge: contextual knowledge, subject matter knowledge, and knowledge of methods and inquiry. Research on teacher planning and interactive thinking is also seen as a means for organizing and transforming subject matter knowledge and curriculum into pedagogically useful forms of routine (Clark, 1986). Both the research on the expert-novice teacher knowledge and on the content and domains of teacher knowledge support the idea that teachers' knowledge and the way in which that knowledge is organized of crucial influence on teacher thinking and action.

The advocates of the epistemological perspective, on the other hand, believe that most of teacher knowledge will not be organized as knowledge, rather such knowledge is seen as personal and practical knowledge (Clandinin & Connelly, 1987) which is not solely cognitive in character. From this perspective, influence of the wider sociocultural

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system, coupled with the influence of the immediate learning environment, have the most contrasting effect on teachers' knowledge. Together with this wide concept of knowledge, the relationship between theory and practice has changed. Scientifically based knowledge is no longer considered the most important knowledge for teachers. Instead, the importance of experienced-based knowledge has been emphasized. This implies a transition from studying the relationship between teacher thinking and actions to studying teachers' actions as an expression of teacher thinking. Recent research on teacher thinking views teacher knowledge as an interpretive framework, or series of "implicit theories," by which teachers attach meaning to their environment and guide their actions within it (Clark, 1988; Calderhead, 1987; Zeichner, Tabachnick, & Densmore 1987).

The above concept of teacher knowledge used in recent research on teacher thinking is most developed by Schon's epistemology of practice. He uses the term "knowledge in action" or "reflection-in-action" to express the relation between theory and practice. The reflection-in-action epistemology suggests that teachers address problematic situations by recalling elements of similar past situations, selecting a move derived from a tentative interpretation of the present situation, attending to the "back talk" in reaction to the move and reframing or reinterpreting the situation (Schon, 1987). Schon's work has been very influential in validating a focus on the practical knowledge of teachers.

The current research on teacher thinking derived from Schon's epistemology of knowledge-in-action further emphasizes personal and practical knowledge (or pedagogical content knowledge) within a broader range of teachers' "professional knowledge". Teachers' professional knowledge goes beyond the classroom realities. It consists of knowledge of socio-political and contextual realities of school life. It defines teacher's personal and practical knowledge within a broader institutional context (Goodson, & Cole, 1994).

The Influence of Context

With the shift of metaphor from teachers as decision makers to teachers as sense makers and reflective practitioners, the dominant psychological epistemology of individual cognitive processing and technical action or knowledge being solely in the mind of the individual has been questioned (Gergen, 1985; Yinger & Hendricks-Lee, 1993). The immersion theory of situated cognition has changed the conception of thinking as a process within an individual's mind, perhaps influenced by a context provided by the situation, to the conception of thinking as an interaction between an individual and a physical and social situation (Greeno, 1989). Based on this social cognitive perspective, context influences knowledge structures, as well as beliefs and theories. Due to the situational aspects of the settings, a knowledge structure elicited from a teacher in one setting will not necessarily be the knowledge structure elicited in another setting (Roehler, Duffy, Herrmann, Conley, & Johnson, 1988). Teachers' professional behavior, therefore, always conforms to the structural, cultural and organizational context in which they work.

This view of knowledge shifted the focus of research on teacher thinking from the individual teacher's cognitive processing and technical action to the relationships between the individual and the context. As indicated earlier, what is learned by teachers is thought to depend primarily on what is provided, and how it is provided by the wider sociocultural system and the immediate learning environment. Knowledge is always marked by its situations-past and present use (Cazden, 1989). Moreover, the situations of classroom and school life do not produce the same responses in every teacher. The background differences that teachers bring to their classroom and school lead them to generate and organize knowledge in very different ways.

A more recent focus on teachers' lives and personal biographies consequently has conceptualized teacher development as rooted in the personal experiences (e.g., Bullough, Knowles & Crow, 1992; Butt & Raymond, 1987; Clandinin, 1986; Connelly & Clandinin, 1990; Knowles, 1992; Knowles & Holt-Reynolds, 1991). Other studies have argued for the personal mode as being linked to broader contextual parameters (e.g., Apple, 1986; Ball & Goodson, 1985; Britzman, 1986; Cole, 1990, 1991; Fox, 1992; Goodson & Cole, 1994; Goodson, 1989, 1988, 1989, 1990; Kelchtermans, 1993; Laffite, 1993; Zeichner & Grant, 1981; Zeichner & Tabachnick, 1985). This latter view stresses that teachers' professional behavior always takes place within the institutional context of a school. The teacher is a member of a team and is held accountable for his/her job by the principal and external bodies (Kelchtermans, 1993). It is true that there is a range of personal, practical and pedagogical knowledge that is important in understanding the teacher's conduct in classroom. There is also a range of knowledge of great importance that deals with the contextual realities of

school life. This is critically important because it affects the lives and arenas in which personal, practical, and pedagogical knowledge are utilized and applied (Goodson & Cole, 1994). Events and experiences, both past and present, that take place at home, school and in broader social spheres help shape teachers' lives and careers.

Culture structures are general guidelines by which people ought to live. These general guidelines affect individuals' behaviors, their interactions with family and friends and even their approaches to education (Hamilton, 1993). The importance of social contexts (Dewy, 1904) cultural settings (Philips, 1983) and social construction (Berger & Luckman, 1966) in schools has been recognized for some time, and much research since that time has supported the importance and impact of the social contexts, cultural settings and social construction in the school arena. The culture of school shapes teachers' understanding of their own actions (Hamilton, 1993; Feiman-Nemser & Floden, 1986; Lortie, 1975; Sarason, 1982; Metrz, 1983, 1986; Rutter, Maughan, Mortimore & Oston, 1979) and that of their students (Tyler, 1987) and is grounded in faculty members' shared definitions (Page, 1988). Such understanding is also linked to a larger social class of the school and to the culture of the community.

Much research on teacher thinking within the paradigm of interpretive research has examined the connections between teacher knowledge and beliefs and their culture. Olson (1988) contends that ". . . . what teachers tell us about their practice is, most fundamentally, a reflection of their culture and cannot be properly understood without reference to that culture. . . ." (1988, p. 69). Cultural knowledge has been studied by looking at cultural patterns in teachers' life histories (e.g., Butt, 1984; Clandinin & Connelly, 1987; Elbaz, 1983, 1990; Richardson, 1989; Tobin, 1990; Wallace & Louden, 1992) and critical incidents in teachers' lives (e.g., Sikes, et al., 1985; Measor, 1985).

Thus a shift has emerged recently toward describing teachers' knowledge and practice, not only in the classroom context, but also within the framework that recognizes the influence of social and institutional cultures. Finding ways to connect teacher thinking and action with the context is the focus of this line of research on teacher thinking.

Toward a New Conceptual Model of Thinking about Teaching

Although research on teachers' thinking does not provide us with a comprehensive theoretical framework for thinking about teaching, a number of assumptions can be derived from research and theory in this field. These assumptions combined with the theories and principles of instructional design models provide a holistic picture that enables us to conceptualize the teachers' performance in the context of the classroom. The scheme proposed here (see Figure 1) provides a framework for thinking about teacher's, teaching or instruction. The scheme explains the major factors in teachers' thinking processes and assumed relationships among them.

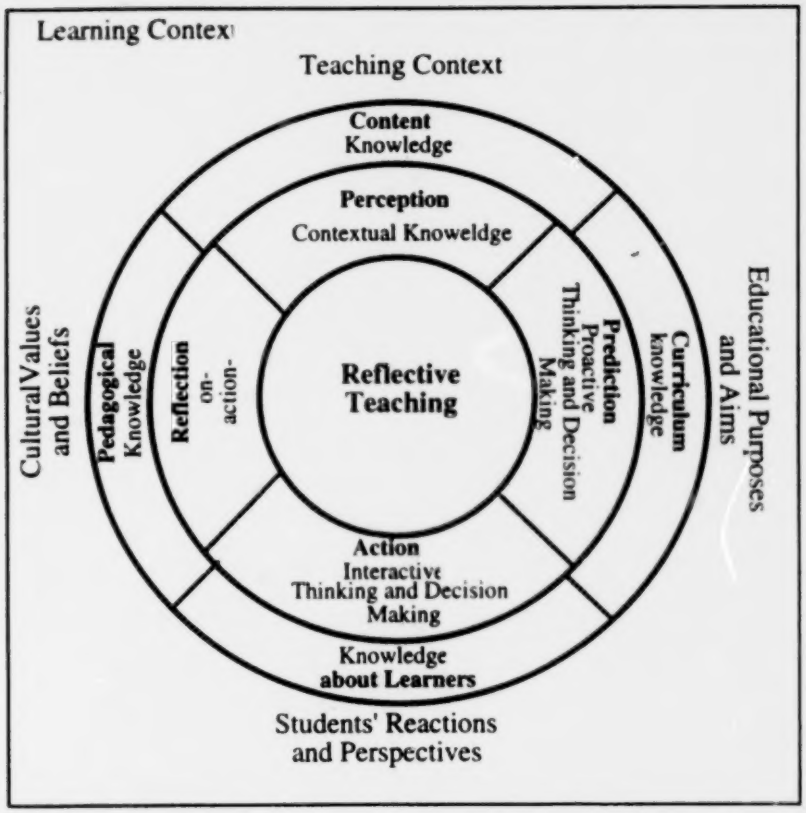

Figure 1. Conceptual Framework for Research on Teaching and Instructional Design

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Three (3) basic characteristics define the proposed scheme. First, it proposes that teaching is a complex, highly contextualized profession, involving a complex form of social interaction that varies depending on context (Calderhead, 1987; Clark, 1986; Clark & Lampert, 1986). The relationship between teacher's thought and his/her action can only be described in relation to a specific learning and teaching context. By learning context we mean an environment where teachers, as learners, are part of a community that actively work together, and share the same social and organizational culture (Britzman, 1986, 1991; Fox, 1992; Goodson & Cole, 1994). Such context affects teacher knowledge and professional responsibilities by formal structure and pressures they exact on the teacher (Clark, 1986; Carter, 1990; Fox, 1992; Gudmundsdottir, 1991; Laffitte, 1993; Pope, 1993; Yinger, 1993). By teaching context we mean teachers, as learners, think on the spot, in relation to the context of the problem and the social climate of the classroom. Subject matter proficiency is not enough; teachers also need to see the subject in the way their students see it in order to transform that vision to benefit their students. Hence, what teachers do can never be comprehended solely in terms of teaching and learning academic subject matter. The formal curriculum of academic knowledge and skills has a counterpart "hidden curriculum" of values and behavior, which is embedded in the social and cultural systems of the school and classroom.

Second, teacher knowledge is grounded in a systemic and holistic notion of learning, knowledge, practice and relationships. It is constructed in the process of reflection, inquiry and action by teachers themselves (Schon, 1987), and it is used in complex ways during the process of planning for and executing teaching activities, as well as in making sense of decisions already made (Johnston, 1992). Knowledge consists of past construction (Fosnot, 1989). Teachers bring a set of predisposed and personal knowledge from their private lives to their practice of teaching (Johnson, 1989; Johnston, 1992).

Third, teaching is a dynamic, on-going, social and dialectical process which is intended to change (Calderhead, 1987). Change in the outer layers (teachers' knowledge and beliefs) is basically caused by the center of the cycle (teachers' reflective action), although the factors coming from one's interpretation of the context can also cause changes in the outer layers. Teachers' conceptions of the context in their professional world are important to consider when they try to change their teaching practice (Carlgren, Lindblad, 1991). The concept of the teacher's culture as a creative, historical system of symbols and meanings is also central to this change (Brown, et al. 1989; Yinger, 1990). The concept of culture is not limited only to verbal expression. Both verbal and nonverbal communication are culturally patterned even though the teacher may not be aware of it. The meaning the teacher gives to his/her experiences (actions) differs from culture to culture. In other words, the way a teacher of a particular culture (e.g., gender, ethnicity, class) categorizes and interprets his/her actions may be different from the way another teacher from another culture would view them.

Figure 1 also shows the basic elements of teaching and teachers' cognition. According to this framework, in order to explain teachers' behavior, it is necessary to look at the classroom as a social and cultural system characterized by reciprocity among participants and between the participants and the physical setting. The basic elements of teaching are the teachers' knowledge, beliefs and perceptions of their craft, which incorporates various students' reactions and perspectives. Skill in teaching rests on teachers' knowledge, which can be divided into pedagogical content knowledge, personal knowledge, knowledge of curriculum and knowledge about learners (Clandinin, 1986; Shulman, 1986a). Teachers' knowledge and beliefs move in a spiral toward more concrete levels of knowledge, which are prediction, action, and reflection. There is a direct relationship between teachers' knowledge and beliefs, and the way they interpret their practice, although much of the knowledge that teachers hold and act on is tacit. The beliefs, values and norms that teachers come to have the most faith in and use most frequently to guide their practice are those consistent with predictions that have "worked" in the complex and demanding classroom arena (Clark & Yinger, 1987). While teachers' preactive plans (predictions) provide frameworks for what is possible or even likely to occur in classrooms in practice, these frameworks do not function as rigid scripts for teacher activity. Instead, in the interactive process of teaching in which cognition is translated into action, teachers engage in moment-to-moment decision making and problem solving based on their perceptions, practical knowledge and judgments about the events. Teachers' metacognitive, purpose-driven behavior and/or reflection on the effect of an action helps them modify their previous pedagogical concepts or build a new pedagogical principle which, in turn, affects their future thinking, planning and action.

Implications of the above Conceptual Model for Research and Instructional Design Practice

The above conceptual model proposes several changes in the ways that research has been conducted in this area. First it suggests that teachers and their teaching and learning processes can only be studied within their social and cultural context. To understand why teachers do what they do, researchers need not only to focus on the present social context of teaching but they also need to consider the historical and organizational context in which teachers have worked for years. Within the historical context of teaching, teachers' life history, as a social context of their beliefs and culture is of particular importance.

The above conceptual framework also suggests that teachers' knowledge is a complex blend of personal, practical and theoretical knowledge . What teachers do is a reflection of this complex and highly social organization of knowledge and cannot be studied without gaining access to them. Research in teaching, learning and instruction, therefore, has to shift its emphasis from cognition to social construction of knowing.

The above model also suggests some changes in instructional design models and principles. First, the image of teachers as designers of their own instruction needs to be emphasized in the instructional technology field. However, the instructional design models and principles should be reconceptualized if they are to be used by teachers. The instructional design models and principles are to consider the social context of learning and teaching. The new conceptualization of the design processes should focus on the decision making processes that can describe the complex, uncertain and content and context-bound approach to instructional design. This new conceptualization should then consider several issues with regard to the concept of design in real-world settings: the context or environment of the design, the experience of the designer and his/her frame of reference, the content specific characteristic of the design, and finally the interactive and

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dynamic nature of the design activity. Each one of these issues should be further investigated and incorporated in the conceptual theory of instructional design.

Second, the concept of design as an artistic, social and cooperative act should replace the procedural and technical concept of design. Instructional design activities should be focused on the product of the design instead of focusing on the procedure. Once the design is conceptualized as an integrated and systemic (holistic) approach that can only be improved through constant and continuous reflection, different instructional design techniques or procedures (analysis, design, development and implementation and evaluation) can be seen or isolated as significant skills to improve teaching performance or developed instructional product. An integrated and systemic approach to instructional designs allows the teacher designer flexibility of the design and emphasizes the teacher designer's interpretations of his/her performance with respect to instructional context.

Finally, instructional design models and principles should focus on an approach in which the design objectives and strategies or solutions evolve as the teacher designer becomes more acquainted with the social and cultural system and subsystems. It should also take an approach in which people who are affected by the design, including learners, are actively participating in the decision making process. The participatory, dialectic and evolving design approach that focuses on the process of negotiation is a form of design that integrates the four familiar phases (analysis, design and development, implementation and evaluation) of instructional design models into one activity. It seems that a cognitive, objective and systematic (step-by-step) approach to designing instruction should be reconsidered if instructional design models are to be used by teachers.

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